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THE HERBARIUM OF THE BOTANICAL SURVEY OF INDIA AT POONA (PUNE)

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BRIEF HISTORY

Foundation location and jurisdiction : Consequent to the reorganisation of the Botanical Survey of India, after Independence and the establishment of various regional circles, the Western Circle came into being on 12th December, 1955 with its headquarters at Poona in the Law College Buildings. This subsequently in the year 1958 shifted to its present location at 7 Koregaon Road, Poona. At the inception of the Circle its jurisdiction extended from Rajasthan & Madhya Pradesh in the north to Karnataka & Kerala in the south representing a cross section of the diverse types of vegetation ranging from the arid tracts in the north to the luxuriant evergreen forests in the south through stages of scrub, deciduous and semi-evergreen zones. However, with the establishment of the Central Circle at Allahabad the States of Rajasthan and Madhya Pradesh were transferred to that Circle and Kerala State & southern tip of Karnataka to the Southern Circle, Coimbatore in 1963. With the birth of yet another Circle viz. the Arid Zone Circle at Jodhpur, the major portion of Gujarat State i.e. north of Tapti river was also transferred to that Circle in 1972. Recently in 1977, the southern tip of Karnataka State comprising of Bangalore, Mysore, Coorg & Mandya has been brought back to the Western Circle. Thus the Western Circle at present covers the entire States of Karnataka & Maharashtra and southern tip of Gujarat (below Tapti river) as also the erstwhile Portuguese Colonies of Goa, Diu, Daman and Dadra Nagar-Haveli and the Minicoy and the Laccadive (Lakshdweep) group of Islands of the Arabian Sea.

Aquisition of old collections of Cooke, Talbot & Indraji Thakar : The herbarium of the Western Zone of the old Botanical Survey of India was transferred from the then Government of Bombay to the Botanical Survey of India, Western Circle in 1956 through the courtsey of Principal L. S. S. Kumar, the then Economic Botanist to the Government of Bombay and Dr. T. G. Shirname, the then Director of Agriculture. This old herbarium was started in 1880 by the Government of Bombay under Dr. Theodore Cooke of the Science College and was initially kept at the Ganeshkhind Botanical Gardens, Poona. Dr. Cooke and Prof. Woodrow, who succeeded him after his retirement in 1896 as Director, undertook a vegetational survey of the entire Bombay Presidency. There were about 5000 sheets belonging to nearly 1395 species by 1899. However, this entire valuable collection was unfortunately destroyed by fire in May 1902, wherein a number of type specimens are also feared to have been lost. But, fortunately Dr, Cooke had a duplicate set of the above said collections and was generous enough to present it to the herbarium. This formed the nucleus of the Poona herbarium and was then located at the Agriculture College, Poona, under the Economic Botanist to the Government of Bombay.

Prof. Gammie succeeded Prof. Woodrow and made large collections not only within the State but from as far as Himalayas, Kashmir to Assam, thereby expanding the dimension of utility of this herbarium. A score of other workers contributed to this herbarium after Prof. Gammie (1902). Talbot's collections, chiefly of North Kanara and his library were purchased and added in 1910. Lastly, the Maharaja of Cutch presented the valuable though small, collections of Jaykrishna Indraji Thakar from Gujarat in 1929. All these collections, form the basis of the existing herbarium of the Western Circle.

COLLECTORS

Dr. Cooke (1880 - 1896) and Prof. Woodrow (1880 - 1899) were the pioneer collectors in starting this herbarium and depositing their collections from the Bombay Presidency. However, due to the lack of proper roads and means of transport, Dr. Cooke had not collected in all the areas of the State, which is amply shown by his notes of distribution in his flora. Dr. Cooke & Prof. Woodrow were assisted by a number of Indian workers like Kanitkar (1891), Ranade (1893) & Bhide (1898), to mention a few. Prof. Gammie (1899 - 1902) also collected in the Presidency and enriched the herbarium. After him, a number of workers like Patwardhan (1908), Paranjpe (1909), Shevde (1909), Burns (1916), Narayana (1922), Godbole (1929) and Garade etc., contributed their share in enriching this herbarium.

Besides, the old herbarium also received plant materials from various sources through gift and exchange. The Royal (now Indian) Botanic Garden, Sibpur, Howrah presented a large collection from Sikkim & Khasi hills. C. Scott (1897) presented about 200 mosses. Saharanpur herbarium and the Forest Research Institute, Dehra Dun also sent some specimens. Ryan (1908) handed over his collections of Thana district. Willis presented a few specimens of the family Podostemaceae. H. P. Paranjpe (1920) presented about 500 specimens from Mesopotomia. Chibber's (1909) collections, mostly from Sind were also added. The collections of Albert, Gage, Mokim, Prain, Scortechini, Chatterjee, King & Fischer from Burma, Calcutta, Assam, Malaya & Ceylon etc. were received in exchange. The collections of Talbot were added in 1910. After Indraji Thakar's death in 1929 all the plant specimens that were on exhibition at Vijaya Vilas Garden, Cutch Mandvi and which were the basis of his first vernacular flora in Gujarati entitled "Plants of Kutch and their utility" were sent to this herbarium.

Since the reorganisation of Western Circle the important collectors who initiated & contributed to the development of the existing recent collections are : General collections from Western India by G. S. Puri (1956-59), R. S. Rao, (1960-72), S. K. Jain (1956-60) & B. M. Wadhwa (1958-61 & 1965-73); A. S. Rao (1961-63) mostly from Indore and Coorg, R. S. Raghavan (1960-) mostly Shimoga. Chikmagalur & South Canara & Kutch, M. Y. Ansari (1858-), Saurashtra, Maharashtra & Daman & Dadra, Nagar-haveli, R. K. Arora (1957-60), from North Kanara & Coorg, B. S. Ahuja (1958-60), parts of Belgaum & Kolhapur, K. C. Kanodia (1958-64), from Rajasthan, S. D. Mahajan (1956-58) & J. A. Vasavda (1956-58). Collectors who had made intensive collections from specific areas are : K. N. Subramanian (1959-62), K. P. Janardhanan (1960-67), B. V. Reddi (1962-65), K. Hemadri (1963-71). K. V. Billore (1967-69), S. K. Malhotra (1967-), B. G. Kulkarni (1964-), R. D. Pataskar (1963-70), P. J. Cherian (1960-67) and N. P. Singh (1965-) etc.

COLLECTIONS

This internationally recognised herbarium (*BSI*), housing also the historic precious collections of T. Cooke (basis for his Flora of Presidency of Bombay, 1901-08), W. A. Talbot (basis for his Forest Flora of the Bombay Presidency and Sind, 1909-11) & J. Indraji Thakar, has 1,32,094 incorporated specimens. This includes type sheets of one new genus, 30 new species and a new variety discovered by the various workers since the inception of this Circle (Table 3) as also many in the Cooke's & Talbot's collection (Table 4) Arranged according to Bentham & Hooker's system of classification, with a little modification according to Hutchinson, the collections also reveal quite a number of new plant records for the respective regions as also many rare plants of economic, horticultural & medicinal value. Analysis of these collections is presented in table 1 wherefrom it is evident that a total of 6519 species & 257 varieties under 1853 genera belonging to 227 families of angiosperms are deposited in the herbarium. besides the gymnosperms and ptridophytes. There is a good moss collection also in the herbarium especially of the Sahyadri Ranges. In Cooke's collections a total of 259 species & 19 varieties under 90 genera & 41 families are available besides 65 species & 2 varieties under 29 genera and 17 families in Gammie's collections. From the herbarium studies it is seen that there are 12 dominant families which have over 100 species as follows : Asteraceae (470), Poaceae (465), Fabaceae (439), Rubiaceae (254), Acanthaceae (219), Lamiaceae (200), Orchidaceae (173), Scrophulariaceae (168), Cyperaceae (149), Euphorbiaceae (137), Convolvulaceae (125) and Asclepiadaceae (101).

The Circle herbarium now has extensive collections from Gujarat, Maharashtra & Karnataka besides representative collections from selected areas of Rajasthan (Jodhpur, Barmer and Udaipur divisions etc.), Madhya Pradesh (Indore district etc.) and Kerala (Tenmalai division etc.). Some of the selected and botanically interesting areas have been intensively explored since the inception of this Circle and the areas well represented in the herbarium include Kutch district in Gujarat. districts of Poona (Bhimashankar and Khed taluka Junnar, Sakarpathar-Ambavane & Sinhagad), Thana, Ratnagiri, Dhulia and Chandrapur in Maharashtra, districts of North Kanara, Shimoga, Chikmagalur & Coorg as also the semi arid regions of Karnataka besides the Union territories of Goa, Diu, Daman, Dadra & Nagar-haveli as well as Laccadive & Minicoy Islands. Areas fairly represented include Saurashtra & Ahwa-Dangs in Gujarat and Nasik, Kolaba, Kolhapur & Sholapur in Maharashtra. Occasionally represented areas include Broach (Rajpipla) & Surat in Gujarat, Aurangabad, Amraoti, Bhandara, Khandesh, Nanded & Yeotmal in Maharashtra & Belgaum. Hassan, Mysore & South Kanara in Karnataka.

Some of the important categories of plants represented in the herbarium include : *rare or collected after a long lapse of time* eg. *Capparis cleghornii* Dunn, *Canscora concanensis* C.B.Cl., *Euphorbia erythroclada* Boiss., *E. katrajensis* Gage, *Ficus talbotii* King, *Manisuris divergens* (Hack.) O. Ktze, *Nilgirianthus warreensis* (Dalz.) Bremek., *Oianthus disciflorus* Hook. f., *Rotala ritchiei* (C.B.Cl.) Koehne, *Schizachyrium paranjpyeanum* (Bhide) Raiz., *Scleria africana* Benth. & *Utricularia equiseticaulis* Blatt. & McC. etc.; *endemic* eg. *Aglaia talbotii* Sundara Raghavan, *Cythocline lutea* Lour. ex Wt., *Buchannia lanceolata* Wt., *Hippocratea africana* Willd., *Danthonidium gammiei* (Bhide) Hubb., *Loranthus stocksii* Hook. f., *Mitreophora grandiflora* Bedd., *Nano-*

TABLE 1 : ANALYSIS OF THE COLLECTIONS DEPOSITED IN THE REGIONAL HERBARIUM AT POONA (PUNE)

Sl. No.	Name of the collections	Total number of herbarium specimens	ANGIOSPERMS								GYMNOSPERMS				PTERIDOPHYTES			
			Dicotyledons				Monocotyledons											
			Fam.	Gen.	Spp.	var.	Fam.	Gen.	Spp.	var.	Fam.	Gen.	Spp.	var.	Fam.	Gen.	Spp.	var.
1.	Recent	90296	157	1057	2791	110	35	282	857	31	7	12	20	1	10	79	230	11
2.	Cooke's	31156	142	1381	2721	84	27	309	894	34	3	11	13	—	15	53	108	2
3.	Talbot's	10422	141	1086	2895	15	24	186	479	—	2	4	7	—	—	—	—	—
4.	Indraji Thacker's	220	65	166	177	1	7	11	9	—	—	—	—	—	1	4	5	—
5.	Total in the regional herbarium	132094	186	1459	5255	191	41	394	1264	66	7	19	29	1	17	95	258	17

TABLE 2 : ANALYSIS OF THE TYPE MATERIAL DEPOSITED IN THE REGIONAL HERBARIUM AT POONA (PUNE)

Sl. No.	Particulars	Total in the regional herbarium	Name of the collections		
			Recent	Cooke's	Talbot's
1.	Total number of type sheets	474	346	51	77
2.	Total number of taxa	90	38	16	36
3.	*Distribution of taxa* :				
	i) Maharashtra State	39	27	9	3
	ia) Poona District	23	18	5	—
	ii) Karnataka State	39	4	5	30
	iia) North Kanara District	31	1	3	27
	iii) Union Territory of Goa	5	2	1	2
	iv) Tamil Nadu State	3	3	—	—
	v) Kerala State	2	2	—	—
	vi) Andhra Pradesh State	1	1	—	—
	vii) Rajasthan State	1	1	—	—
4.	*Major families represented* :				
	i) Taxa belonging to family Poaceae	26	15	8	3
	ii) Taxa belonging to family Asclepiadaceae	8	7	1	—
	iii) Taxa belonging to family Rubiaceae	6	1	—	5
5.	*Nature of type sheets* :				
	i) Holotype	19	—	2	17
	ii) Isotype	48	31	6	11
	iii) Syntype	22	—	4	18
	iv) Paratype	77	65	8	4
	v) Neotype	2	2	—	—
	vi) Uncategorised	14	—	7	7
	vii) Type photos	5	5	—	—

TABLE 3 : NEW TAXA DESCRIBED SINCE 1956 FROM THE REGIONAL HERBARIUM AT POONA (PUNE)

Sl. No.	Name of the taxa	Family	Type locality
1.	*Seshagiria sahyadrica* Ans. et Hem.	Asclepiadaceae	Sinhagad (Poona), Maharashtra
2.	*Acroblastum ambavanense* Reddi	Balonophoraceae	Ambavane (Poona) "
3.	*Alysicarpus vasavadae* Hem.	Fabaceae	Junnar (Poona) "
4.	*Arthraxon deccanensis* Jain	Poaceae	Sinhagad (Poona) "
5.	*A. junnarensis* Jain et Hem.	"	Junnar (Poona) "
6.	*A. lancifolius* (Trin.), Hochst. var. *hindustanicus* Jain et Desp.	"	Porvorim, Goa
7.	*A. raizadae* Hem. et Bill.	"	Mahabaleshwar (Satara), Maharashtra
8.	*Blumea venkataramanii* Rolla Rao et Hem.	Asteraceae	Vadgaon (Poona) "
9.	*Bothriochloa jainii* Deshp. et Hem.	Poaceae	Junnar (Poona) "
10.	*Ceropegia huberi* Ans.	Asclepiadaceae	Ambaghat (Ratnagiri) "
11.	*C. mahabalei* Hem. et Ans.	"	Junnar (Poona) "
12.	*C. noorjahaneae* Ans.	"	Wai-Panchgani ghat (Satara), Maharashtra
13.	*C. rollae* Hem.	"	Junnar (Poona) "
14.	*C. sahyadrica* Ans. et Kulk.	"	Ambolighat (Ratnagiri) "
15.	*C. santapaui* Wadh. et Ans.	"	Mahabaleshwar (Satara) "
16.	*Chlorophytum bharuchae* Ans., Ragh. et Hem.	Liliaceae	Junnar (Poona) "
17.	*Cyanotis arcotensis* Rolla Rao	Commelinaceae	North Arcot, Tamil Nadu
18.	*C. cerifolia* Rolla Rao et Kammathy	"	Poona, grown from Anamalais, Kerala
19.	*Cyperus pentabracteatus* Govind. et Hem.	Cyperaceae	Junnar (Poona), Maharashtra
20.	*Fimbristylis unispicularis* Govind et Hem.	"	" "
21.	*Isachne borii* Hem.	Poaceae	" "
22.	*I. mysorensis* Sundara Raghavan	"	Agumbe (Shimoga), Karnataka
23.	*Ichaemum raizadae* Hem. et Bill.	"	Sadryaghat (Thana), Maharashtra
24.	*Leucas deodikarii* Bill. et Hem.	Lamiaceae	Junnar (Poona) "
25.	*Manisuris goaensis* Rolla Rao et Hem.	Poaceae	Cortalim, Madgao Road, Goa
26.	*M. mysorensis* Jain et Hem.	"	Castlerock (North Kanara), Karnataka
27.	*M. ratnagirica* Kulk. et Hem.	"	Ambolighat (Ratnagiri), Maharashtra
28.	*M. santapaui* Jain et Deshp.	"	Ratnagiri "
29.	*Pimpinella katrajensis* Rolla Rao et Hem.	Apiaceae	Poona, grown from Junnar Maharashtra
30.	*Smithia agharkarii* Hem.	Fabaceae	Junnar (Poona) "
31.	*Tarenna agumbensis* Sundara Raghavan	Rubiaceae	Agumbe (Shimoga), Karnataka

TABLE 4 : A LIST OF THE TYPE MATERIAL DEPOSITED IN THE REGIONAL HERBARIUM AT POONA (PUNE)

Sl. No.	Name of the taxa in Talbot's collections	Sl. No.	Name of the taxa in Cooke's collections
1.	*Aglaia littoralis* Talb.	1.	*Abutilon ranadei* Woodrow et Stapf
2.	*Anotis prainiana* Talb.	2.	*Andropogon paranjapyeanum* Bhide
3.	*Blyxa talbotii* Hook. f.	3.	*Bhidea burnsiana* Bor
4.	*Cryptocarya procera* Talb.	4.	*Cynodon barberi* Rang. & Tad.
5.	*Dimeria woodrowii* Stapf	5.	*Danthonia gammiei* Bhide
6.	*Dysoxylum glandulosum* Talb.	6.	*Dendrobium mabelae* Gammie
7.	*Eriocaulon horsley-kundae* Fyson	7.	*Eleiotis trifoliata* Cooke
8.	*Eugenia kanarensis* Talb.	8.	*Enteropogon badamicus* Bhide
9.	*E. memecylifolia* Talb.	9.	*Euphorbia katrajensis* Gage
10.	*E. utilis* Talb.	10.	*Fimbristylis woodrowii* Clarke
11.	*Ficus talbotii* King.	11.	*Manisuris acuminata* (Hack.) O. Ktze. var. *woodrowii* Bor
12.	*Garcinia malabarica* Talb.	12.	*Marsdenia lanceolata* Cooke
13.	*Gymnosporia konkanensis* Talb.	13.	*Pogonachne racemosa* Bor
14.	*Habenaria multicaudata* Sedgwick.	14.	*Ventilago maderaspatana* Gaertn. var. *fructifida* Santapau
15.	*Impatiens talbotii* Hook. f.		
16.	*Lasianthus sessilis* Talb.		
17.	*Leea talbotii* King ex Talb.		
18.	*Leucas angustissima* Sedgwick		
19.	*Loranthus gibbosus* Talb.		
20.	*Manisuris forficulata* Fischer emend. Jain		
21.	*Neuropeltis malabarica* van Oostrstr.		
22.	*Phyllanthus talbotii* Sedgwick		
23.	*Plectranthus parvifolius* Talb.		
24.	*Polygonum hydropiper* Linn. var. *glandulosissima* Gage		
25.	*Psychotria canarensis* Talb.		
26.	*P. flavida* Talb.		
27.	*P. octosulcata* Talb.		
28.	*Rottboellia talbotii* Hook. f.		
29.	*Salacia talbotii* Gamble		
30.	*Strobilanthes membrananceus* Talb.		
31.	*S. minor* Talb.		
32.	*Strombosia leprosa* Talb.		
33.	*Symplocos kanarana* Talb.		
34.	*Vernonia ornata* Talb.		
35.	*Viscum trilobatum* Talb.		

Besides the new taxa (*vide* table 3) the type sheets of the following species are also deposited in the recent collections.

1. *Arisaema caudatum* Engler
2. *Capillipedium magdaleni* Almeida
3. *Dimeria santapaui* Almeida
4. *Lasiurus ecaudatus* Satya. et Shank.
5. *Pimpinella lateriflora* Dalz.
6. *Oryza malumpuzhaensis* Krish. et Chandra.

thamnus sericeus Thoms. & *Semecarpus auriculata* Bedd. etc.; *endangered* eg. : *Frerea indica* Dalz., *Ceropegia fantastica* Sedgw., *Belosynapsis kewensis* Hassk., *Bhidea burnsiana* Bor, *Leea talbotii* King ex Talb., *Gnetum ula* Brongn., *Crotalaria priestelyoides* Baker, & *Theriophonum indicum* Engl. etc.; *ornamental plants* eg. : *Abutilon persicum* (Burm. f.) Merr., *Ceropegia* sps., *Dendrobium barbatulum* Lindl., *Dysophylla stellata* Benth., *Eulophia ochreata* Lindl., *Ipomoea pes-capre* (Linn.) Sweet, *Rhynchostylis retusa* Bl. & *Senecio grahami* Hook. f. etc.: *drug plants* : *Argyreia* sps., *Holerrhena antidysenterica* (Linn.) Wall. ex G. Don, *Lobelia nicotianaefolia* Benth. ex R. & S., *Ensete superbum* (Roxb.) Cheesman, *Hydnocarpus laurifolia* (Dennst.) Sleumer, *Psoralea corylifolia* Linn., *Salacia chinensis* Linn. & *Tylophora indica* (Burm. f.) Merr. etc.; *plants used by tribals* eg. : *Hyphaene indica* Becc., *Nyctanthes arbor-tristis* Linn. and *Scirpus kysoor* Roxb. etc.; *exploitable plant species* like *Blumea eriantha* DC. and *Bothriochloa odorata* (Lisboa) A. Camus etc.; *foreign exchange earning plants* like species of *Iphigenia* Kunth, especially *I. stellata* Blatt.; and *exotic weeds* assuming alarming proportions and needing prompt attention eg. *Parthenium hysterophorus* Linn., *Schouwia arabica* (Vahl) A.P.DC., *Eichhornia crassipes* (Mast.) Solms and *Salvinia cucculiata* Roxb. ex Berg. etc.

As mentioned earlier, a good amount of type material is also deposited in the herbarium. In fact, it has 474 type sheets belonging to 90 taxa under 66 genera & 32 families. The analysis of the same is presented in table 2. Here again we could see that Maharashtra & Karnataka are the two States which are mainly represented; Poona & North Kanara districts dominating within these States respectively. Type sheets of all the new taxa described since 1956 (Table 3) as also of the taxa listed in table 4 are deposited in the herbarium.

ACCESSORIES OF THE HERBARIUM

A museum, carpological collection, library, laboratory, photographic & artist sections and an Experimental Garden is attached to the herbarium. The museum has over 600 exhibits depicting the raw plant materials and their final products. The library caters mostly to the specialised field of systematic botany & floristics and has a total of 6384 books.

ACTIVITIES

Since its revival the Circle had undertaken extensive and intensive explorations in order to prepare various State Floras on modern basis and help revising the Flora of India. The findings, throwing light on the botanical wealth and new knowledge, have been published in the form of over 200 scientific papers in various journals of which over 30 papers deal with new taxa and their description, about 15 papers deal with interesting species that have been rediscovered after a long time, quite a few pertain to new records or plant accounts & a number of them dealing with floristics of specific areas.

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